



(19)

(11) Publication number: **06089845 A**

Generated Document

## PATENT ABSTRACTS OF JAPAN

(21) Application number: **04266568**(51) Intl. Cl.: **H01L 21/027 B23P 21/00 G03F 9/00 H01L 21/68**(22) Application date: **08.09.92**

(30) Priority:

(43) Date of application publication: **29.03.94**

(84) Designated contracting states:

(71) Applicant: **NIKON CORP**(72) Inventor: **SHIMIZU KENJI  
OTA TOSHIYA**

(74) Representative:

**(54) SUBSTRATE  
POSITIONING DEVICE**

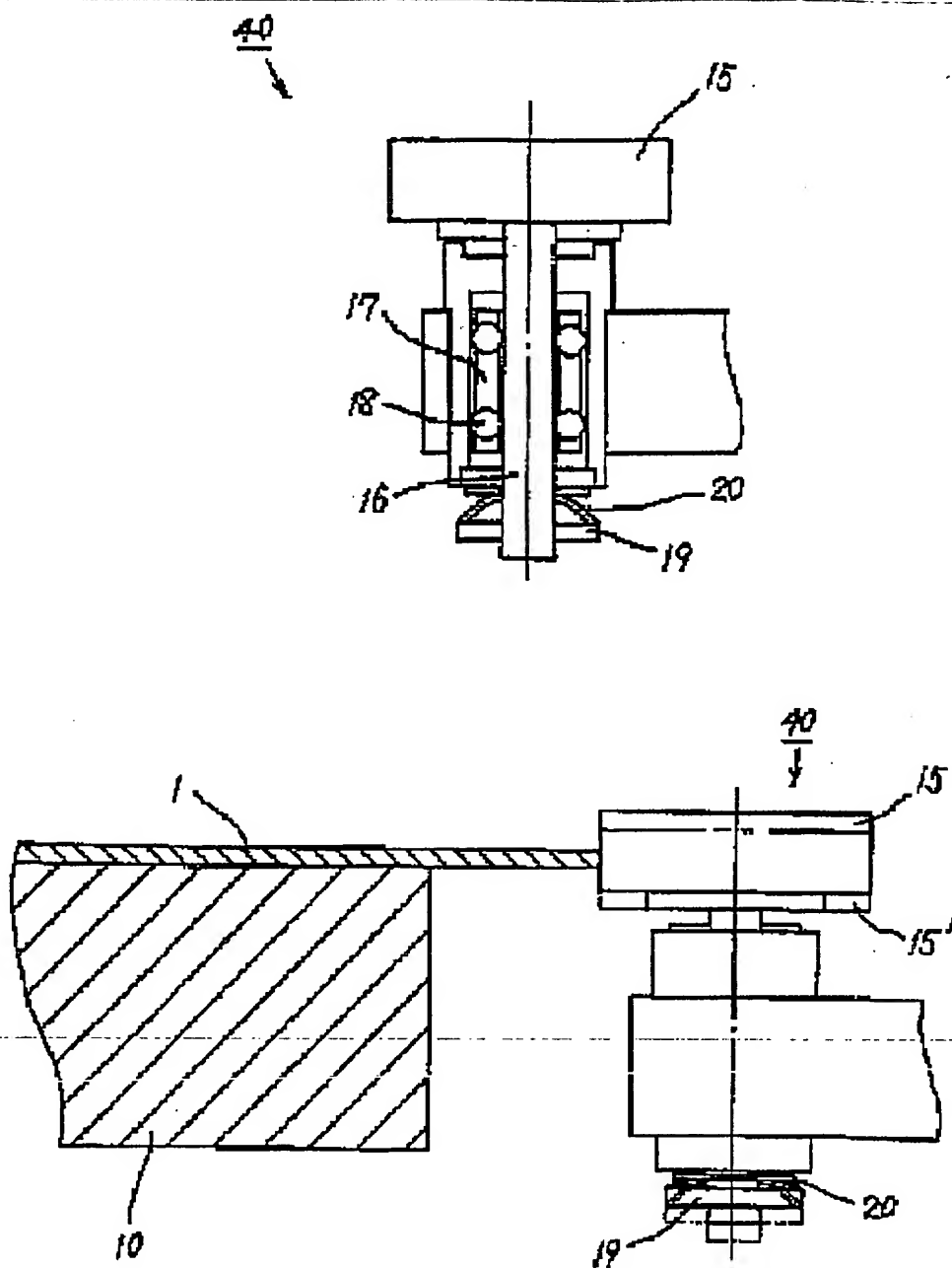
(57) Abstract:

PURPOSE: To prevent a substrate from warping and to prevent friction between a substrate and a roller by positioning a substrate by using a pressure roller having a roller which rises as the substrate which is an object of positioning rises.

CONSTITUTION: After a substrate 1 is positioned by pressing a periphery of the substrate 1 mounted on a temporary pedestal by a pressure roller 40, a holder 10 provided below the substrate 1 is made to rise to mount the substrate 1 on the holder 10. The pressure roller 40 is constituted of a roller 15 which rotates around a shaft 16 extending along a rising direction of the holder 10 and moving in a rising direction of the holder 10. The roller 15 pressed to the substrate 1 is made to move in accordance with rising movement of the substrate 1 when the substrate 1 is

mounted on a mounting surface of the holder 10. Since the substrate 1 can be thereby prevented from warping, it is possible to realize a substrate positioning device which can prevent dust from being raised by friction between a substrate and a roller and can prevent damage on a substrate such as chipping.

COPYRIGHT: (C)1994,JPO&Japio



## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

---

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] After positioning the above-mentioned substrate by forcing the perimeter of the substrate laid in the predetermined force piece base in the periphery, and therefore pushing against a roller, In the substrate pointing device which therefore lays the above-mentioned substrate on the above-mentioned holder raising the holder with which the above-mentioned substrate was formed caudad the above-mentioned forcing roller It consists of rollers which move in the above-mentioned rise direction of the above-mentioned holder while rolling \*\*\*\*\* stretch \*\*\*\* as a core in the above-mentioned rise direction of the above-mentioned holder. The substrate pointing device characterized by making it move the above-mentioned roller pushed against the above-mentioned substrate according to migration of the above-mentioned substrate at the time of the above-mentioned substrate being laid in the installation side of the above-mentioned holder.

---

[Translation done.]

## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention is applied to the PURIARAIMENTO equipment which positions mechanically the substrate as exposed members, such as a semi-conductor wafer or a glass substrate, concerning a substrate pointing device, and is suitable.

[0002]

[Description of the Prior Art] Conventionally, in the aligner which manufactures a liquid crystal display component or a semiconductor device, the PURIARAIMENTO equipment which carries out alignment preparatorily is built into the location which was able to determine beforehand the glass plate or the disc-like semi-conductor wafer used as an exposed substrate. In this PURIARAIMENTO equipment, it is made as [ push / substrates, such as a glass plate or a wafer, / against a criteria pin etc. / mechanically ].

[0003] That is, as shown in drawing 3, a substrate pointing device is equipped with the force piece bases 9A-9D for positioning, while supporting the glass plate 1 as a substrate temporarily, and the forcing rollers 8A-8F which position the glass plate 1 are formed around the force piece bases 9A-9D. These forcing rollers 8A-8F are driven in the direction which therefore presses the opposite sides of the glass plate 1 on force piece base 9A - 9D to driving gears 7A-7F, and are made as [ position / the glass plate 1 / this / on force piece base 9A - 9D ].

[0004] That is, in drawing 3, after setting to an evacuation location each forcing rollers 8A-8F with which driving gears 7A-7F correspond, therefore, the glass plate 1 is laid on force piece base 9A - 9D at a plate transport device (un-illustrating).

[0005] At this time, the pressure gas from a gas source of supply (un-illustrating) is supplied between an installation side and the rear face of the glass plate 1 in the force piece bases 9A-9D; and the gas layer (air bearing) of micron order is formed between the force piece bases 9A-9D and the glass plate 1. Therefore, the forcing rollers 8A-8F are moved to driving gears 7A-7F in X and the direction of Y after that, respectively, and the opposite sides are pressed by predetermined thrust, respectively.

[0006] Therefore, the holder 10 equipped with vacuum piping equipment (un-illustrating) in this condition goes up to a predetermined driving gear (un-illustrating) on a stage 11. This receives the glass plate 1 from the force piece bases 9A-9D to adsorption and coincidence, while PURIARAIMENTO [ the predetermined location on a holder 10 ]. Then, the forcing rollers 8A-8F go up to an evacuation location, and return and a stage 11 continue going up to an exposure location again.

[0007]

[Problem(s) to be Solved by the Invention] By the way, in the PURIARAIMENTO equipment shown in drawing 3, the forcing rollers 8A-8F are constituted, respectively, as shown in drawing 4. That is, the forcing rollers 8A-8F are installed in a fixed location to a holder 10 and the force piece bases 9A-9D, respectively, therefore, are supported pivotably by the radial bearing 13 free [ rotation of a shaft 12 ], and they are constituted so that the roller 14 of synthetic-resin nature may rotate to the point of the shaft 12 concerned at a shaft 12 and one.

[0008] In case the glass plate 1 is delivered to a holder 10 from the force piece bases 9A-9D in the condition of having pushed here and therefore having been pushed against Rollers 8A-8F, it will be in the condition of the glass plate 1 having pushed and having contacted the roller 14 which are Rollers 8A-8F, and a holder 10 will go up in the condition [ that the glass plate 1 is further in contact with a roller 14 ].

[0009] However, when free migration of an parallel direction cannot do such forcing rollers 8A-8F to a shaft 12, the \*\*\*\*\* glass plate 1 will curve caudad in a rise of a holder 10. Therefore, the problem which induces the crack of the glass plate 1 with which the minute check in the raising dust, the chip, and degree process between the glass plate 1 and

a roller 14 becomes a cause is \*\*\*\*\*.

[0010] There is a method of pushing at the moment of the holder 10 going up being adsorbed in the glass plate 1 as one approach for solving this trouble, and moving Rollers 8A-8F to an evacuation location. However, by being in the condition that push in this approach in case the glass plate 1 is adsorbed, and Rollers 8A-8F have not pushed, there is a problem to which PURIARAIMENTO precision falls, and it is still inadequate as a solution, and \*\*\*\*\*.

[0011] This invention was made in consideration of the above point, and tends to propose the substrate pointing device it may be made for curvature not to produce in substrates, such as a glass plate.

[0012]

[Means for Solving the Problem] In order to solve this technical problem, it sets to this invention. After positioning a substrate 1 by forcing the perimeter of the substrate 1 laid in the predetermined force piece bases 9A-9D in the periphery, and therefore pushing against a roller 40, In the substrate pointing device which therefore lays a substrate 1 on a holder 10 raising the holder 10 with which the substrate 1 was formed caudad the forcing roller 40 It consists of rollers 15 which move in the rise direction of a holder 10 while rolling \*\*\*\*\* stretch \*\*\*\* 16 as a core in the rise direction of a holder 10. It is made to move the roller 15 pushed against the substrate 1 according to the updrift of the substrate 1 at the time of a substrate 1 being laid in the installation side of a holder 10.

[0013]

[Function] The curvature of a substrate 1 can be prevented by having enabled it to move the roller 15 pushed against the substrate 1 concerned according to the updrift of a substrate 1.

[0014]

[Example] About a drawing, one example of this invention is explained in full detail below.

[0015] Drawing 1 is replaced with and used for the forcing rollers 8A-8F of the PURIARAIMENTO equipment which shows the forcing roller 40 of the substrate pointing device by this invention, and is shown in drawing 3. The cylinder-like roller 15 with which this forcing roller 40 was therefore formed in synthetic resin is directly linked with a shaft 16, and two or more bearings 18 held at the cylindrical retainer 17 are arranged around the shaft 16.

[0016] it is included in the attaching part (un-illustrating) to which these carried out location appearance and were carried out to the glass plate 1 ( drawing 3 ) and the force piece bases 9A-9D ( drawing 3 ). Thereby, a roller 15 is movable to rolling and the upper part. Therefore, the glass plate 1 is positioned from the direction of a shaft 16, and the direction which intersects perpendicularly to contacting the peripheral surface of this roller 15.

[0017] Moreover, the stopper 19 is being fixed to the lower limit section of a shaft 16, and, therefore, flat spring 20 is held at the stopper 19 concerned. Therefore, a roller 15 and a shaft 16 can be prevented from falling out and coming out. Although the energization force of flat spring 20 will be resisted in case it pushes here and a roller 40 therefore displaces up on the glass plate 1, the force is a thing of extent which helps for the forcing roller 40 to fall to a self-weight below therefore. In addition, especially when a shaft 16 is caudad located by unloaded condition, it is not necessary to form this flat spring 20.

[0018] In the above configuration, as shown in drawing 2, while a holder 10 therefore goes up to a non-illustrated driving gear, the glass plate 1 is received. The glass plate 1 was begun and it has contacted in the location of roller 15 of the forcing roller 40, and although the glass plate 1 goes up after that, the \*\*\*\*\* roller 15 can be pulled up upwards. Although flat spring 20 is forced and the energization force to a lower part is generated, this energization force is very small and is not made to transform the periphery of the glass plate 1 at this time.

[0019] Therefore, the forcing roller 40 is returned to an evacuation location at a non-illustrated driving gear at the same time delivery of the glass plate 1 is completed. Under the present circumstances, when the glass plate 1 and a roller 15 estrange, therefore, a roller 15 is pulled back by flat spring 20 at a position.

[0020] Like drawing 3, six places of this forcing roller 40 are arranged around interim tables 9A-9D, and, therefore, it carries out positioning and delivery of the glass plate 1 to the same actuation as the sequence mentioned above about drawing 3. When it pushes according to a rise of the glass plate 1 in this way and the roller 15 of a roller 40 goes up, it can avoid producing curvature on the glass plate 1.

[0021] While being able to prevent the chip of the raising dust by friction, or the glass plate 1 in between the glass plate 1 and a roller 15 by having been made to position the glass plate 1 to a rise of the glass plate 1 using the forcing roller 1 which has the roller 15 which carries out a \*\*\*\*\* rise according to the above configuration, the crack of the glass plate 1 with which the minute check in degree process becomes a cause etc. can be prevented beforehand.

[0022] In addition, in an above-mentioned example, although the case where flat spring 20 was used as an energization member was described, even if this invention applies other energization means, such as not only this but coiled spring, it can acquire the same effectiveness as an above-mentioned case.

[0023] Moreover, in an above-mentioned example, although the case where the glass plate 1 was used as a substrate

used as the candidate for positioning was described, this invention can apply this, when using other substrates, such as not only this but a semi-conductor wafer.

~~[0024] In a further above-mentioned example, although the case where this invention was applied to a pro-squeak-tee—~~  
type exposure machine was described, this invention is suitable with the application of this also in the delivery section which needs the high degree of accuracy of not only this but other various devices.

[0025]

[Effect of the Invention] As mentioned above, according to this invention, by having positioned the substrate using the forcing roller which has the roller which carries out a \*\*\*\*\* rise to the rise of the substrate used as the candidate for positioning, the curvature of a substrate can be prevented and, thereby, friction between a substrate and a roller can be prevented. Therefore, the substrate pointing device which can prevent breakage of the chip of the raising dust by friction— and a substrate etc. between the substrate concerned and a roller is realizable.

---

[Translation done.]

\* NOTICES \*

---

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

TECHNICAL FIELD

[Industrial Application] This invention is applied to the PURJARAMENTO equipment which positions mechanically the substrate as exposed members, such as a semi-conductor wafer or a glass substrate, concerning a substrate pointing device, and is suitable.

---

[Translation done.]

\* NOTICES \*

~~JPO and NCIP are not responsible for any damages caused by the use of this translation.~~

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

PRIOR ART

---

[Description of the Prior Art] Conventionally, in the aligner which manufactures a liquid crystal display component or a semiconductor device, the PURIARAIMENTO equipment which carries out alignment preparatorily is built into the location which was able to determine beforehand the glass plate or the disc-like semi-conductor wafer used as an exposed substrate. In this PURIARAIMENTO equipment, it is made as [ push / substrates, such as a glass plate or a wafer, / against a criteria pin etc. / mechanically ].

[0003] That is, as shown in drawing 3 , a substrate pointing device is equipped with the force piece bases 9A-9D for positioning, while supporting the glass plate 1 as a substrate temporarily, and the forcing rollers 8A-8F which position the glass plate 1 are formed around the force piece bases 9A-9D. These forcing rollers 8A-8F are driven in the direction which therefore presses the opposite sides of the glass plate 1 on force piece base 9A - 9D to driving gears 7A-7F, and are made as [ position / the glass plate 1 / this / on force piece base 9A - 9D ].

[0004] That is, in drawing 3 , after setting to an evacuation location each forcing rollers 8A-8F with which driving gears 7A-7F correspond, therefore, the glass plate 1 is laid on force piece base 9A - 9D at a plate transport device (un-illustrating).

[0005] At this time, the pressure gas from a gas source of supply (un-illustrating) is supplied between an installation side and the rear face of the glass plate 1 in the force piece bases 9A-9D, and the gas layer (air bearing) of micron order is formed between the force piece bases 9A-9D and the glass plate 1. Therefore, the forcing rollers 8A-8F are moved to driving gears 7A-7F in X and the direction of Y after that, respectively, and the opposite sides are pressed by predetermined thrust, respectively.

[0006] Therefore, the holder 10 equipped with vacuum piping equipment (un-illustrating) in this condition goes up to a predetermined driving gear (un-illustrating) on a stage 11. This receives the glass plate 1 from the force piece bases 9A-9D to adsorption and coincidence, while PURIARAIMENTO-[ the predetermined location on a holder 10.]-Then, the forcing rollers 8A-8F go up to an evacuation location, and return and a stage 11 continue going up to an exposure location again.

---

[Translation done.]



\* NOTICES \*

~~JPO and NCIPi are not responsible for any~~  
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, according to this invention, by having positioned the substrate using the forcing roller which has the roller which carries out a \*\*\*\*\* rise to the rise of the substrate used as the candidate for positioning, the curvature of a substrate can be prevented and, thereby, friction between a substrate and a roller can be prevented. Therefore, the substrate pointing device which can prevent breakage of the chip of the raising dust by friction and a substrate etc. between the substrate concerned and a roller is realizable.

---

[Translation done.]

## \* NOTICES \*

~~JPO and NCIP are not responsible for any damages caused by the use of this translation.~~

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, in the PURIARAIMENTO equipment shown in drawing 3, the forcing rollers 8A-8F are constituted, respectively, as shown in drawing 4. That is, the forcing rollers 8A-8F are installed in a fixed location to a holder 10 and the force piece bases 9A-9D, respectively, therefore, are supported pivotably by the radial bearing 13 free [rotation of a shaft 12], and they are constituted so that the roller 14 of synthetic-resin nature may rotate to the point of the shaft 12 concerned at a shaft 12 and one.

[0008] In case the glass plate 1 is delivered to a holder 10 from the force piece bases 9A-9D in the condition of having pushed here and therefore having been pushed against Rollers 8A-8F, it will be in the condition of the glass plate 1 having pushed and having contacted the roller 14 which are Rollers 8A-8F, and a holder 10 will go up in the condition [that the glass plate 1 is further in contact with a roller 14].

[0009] However, when free migration of an parallel direction cannot do such forcing rollers 8A-8F to a shaft 12, the \*\*\*\*\* glass plate 1 will curve caudad in a rise of a holder 10. Therefore, the problem which induces the crack of the glass plate 1 with which the minute check in the raising dust, the chip, and degree process between the glass plate 1 and a roller 14 becomes a cause is \*\*\*\*\*.

[0010] There is a method of pushing at the moment of the holder 10 going up being adsorbed in the glass plate 1 as one approach for solving this trouble, and moving Rollers 8A-8F to an evacuation location. However, by being in the condition that push in this approach in case the glass plate 1 is adsorbed, and Rollers 8A-8F have not pushed, there is a problem to which PURIARAIMENTO precision falls, and it is still inadequate as a solution, and \*\*\*\*\*.

[0011] This invention was made in consideration of the above point, and tends to propose the substrate pointing device it may be made for curvature not to produce in substrates, such as a glass plate.

[Translation done.]

\* NOTICES \*

~~JPO and NCIPi are not responsible for any~~  
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

MEANS

[Means for Solving the Problem] In order to solve this technical problem, it sets to this invention. After positioning a substrate 1 by forcing the perimeter of the substrate 1 laid in the predetermined force piece bases 9A-9D in the periphery, and therefore pushing against a roller 40, In the substrate pointing device which therefore lays a substrate 1 on a holder 10 raising the holder 10 with which the substrate 1 was formed caudad the forcing roller 40 It consists of rollers 15 which move in the rise direction of a holder 10 while rolling \*\*\*\*\* stretch \*\*\*\* 16 as a core in the rise direction of a holder 10. It is made to move the roller 15 pushed against the substrate 1 according to the updrift of the substrate 1 at the time of a substrate 1 being laid in the installation side of a holder 10.

---

[Translation done.]

\* NOTICES \*

---

JPO and NCIPF are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

OPERATION

---

[Function] The curvature of a substrate 1 can be prevented by having enabled it to move the roller 15 pushed against the substrate 1 concerned according to the updrift of a substrate 1.

---

[Translation done.]

\* NOTICES \*

~~JPO and NCIPi are not responsible for any damages caused by the use of this translation.~~

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

EXAMPLE

[Example] About a drawing, one example of this invention is explained in full detail below.

[0015] Drawing 1 is replaced with and used for the forcing rollers 8A-8F of the PURIARAIMENTO equipment which shows the forcing roller 40 of the substrate pointing device by this invention, and is shown in drawing 3. The cylinder-like roller 15 with which this forcing roller 40 was therefore formed in synthetic resin is directly linked with a shaft 16, and two or more bearings 18 held at the cylindrical retainer 17 are arranged around the shaft 16.

[0016] it is included in the attaching part (un-illustrating) to which these carried out location appearance and were carried out to the glass plate 1 ( drawing 3 ) and the force piece bases 9A-9D ( drawing 3 ). Thereby, a roller 15 is movable to rolling and the upper part. Therefore, the glass plate 1 is positioned from the direction of a shaft 16, and the direction which intersects perpendicularly to contacting the peripheral surface of this roller 15.

[0017] Moreover, the stopper 19 is being fixed to the lower limit section of a shaft 16, and, therefore, flat spring 20 is held at the stopper 19 concerned. Therefore, a roller 15 and a shaft 16 can be prevented from falling out and coming out. Although the energization force of flat spring 20 will be resisted in case it pushes here and a roller 40 therefore displaces up on the glass plate 1, the force is a thing of extent which helps for the forcing roller 40 to fall to a self-weight below therefore. In addition, especially when a shaft 16 is caudad located by unloaded condition, it is not necessary to form this flat spring 20.

[0018] In the above configuration, as shown in drawing 2, while a holder 10 therefore goes up to a non-illustrated driving gear, the glass plate 1 is received. The glass plate 1 was begun and it has contacted in the location of roller 15' of the forcing roller 40, and although the glass plate 1 goes up after that, the \*\*\*\*\* roller 15 can be pulled up upwards. Although flat spring 20 is forced and the energization force to a lower part is generated, this energization force is very small and is not made to transform the periphery of the glass plate 1 at this time.

[0019] Therefore, the forcing roller 40 is returned to an evacuation location at a non-illustrated driving gear at the same time delivery of the glass plate 1 is completed. Under the present circumstances, when the glass plate 1 and a roller 15 estrange, therefore, a roller 15 is pulled back by flat spring 20 at a position.

[0020] Like drawing 3, six places of this forcing roller 40 are arranged around interim tables 9A-9D, and, therefore, it carries out positioning and delivery of the glass plate 1 to the same actuation as the sequence mentioned above about drawing 3. When it pushes according to a rise of the glass plate 1 in this way and the roller 15 of a roller 40 goes up, it can avoid producing curvature on the glass plate 1.

[0021] While being able to prevent the chip of the raising dust by friction, or the glass plate 1 in between the glass plate 1 and a roller 15 by having been made to position the glass plate 1 to a rise of the glass plate 1 using the forcing roller 1 which has the roller 15 which carries out a \*\*\*\*\* rise according to the above configuration, the crack of the glass plate 1 with which the minute check in degree process becomes a cause etc. can be prevented beforehand.

[0022] In addition, in an above-mentioned example, although the case where flat spring 20 was used as an energization member was described, even if this invention applies other energization means, such as not only this but coiled spring, it can acquire the same effectiveness as an above-mentioned case.

[0023] Moreover, in an above-mentioned example, although the case where the glass plate 1 was used as a substrate used as the candidate for positioning was described, this invention can apply this, when using other substrates, such as not only this but a semi-conductor wafer.

[0024] In a further above-mentioned example, although the case where this invention was applied to a pro squeak tee type exposure machine was described, this invention is suitable with the application of this also in the delivery section which needs the high degree of accuracy of not only this but other various devices.

[Translation done.]

\* NOTICES \*

~~JPO and NCIP are not responsible for any damages caused by the use of this translation.~~

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

DESCRIPTION OF DRAWINGS

---

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing the forcing roller of the substrate pointing device by this invention.

[Drawing 2] It is the side elevation with which explanation of actuation of an example is presented.

[Drawing 3] It is the perspective view showing conventional PURIARAIMENTO equipment.

[Drawing 4] It is the sectional view showing the conventional forcing roller.

[Description of Notations]

1 [ .. A roller, 16 / .. A shaft, 19 / .. A stopper, 20 / .. Flat spring, 40 / .. Forcing roller ] .... A glass plate, 9A-9D .. A force piece base, 10 .. A holder, 15

---

[Translation done.]

## \* NOTICES \*

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

[Drawing 1]

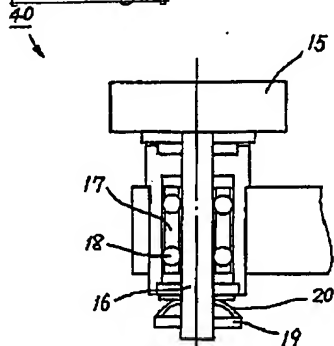


図1 実施例の構成

[Drawing 2]

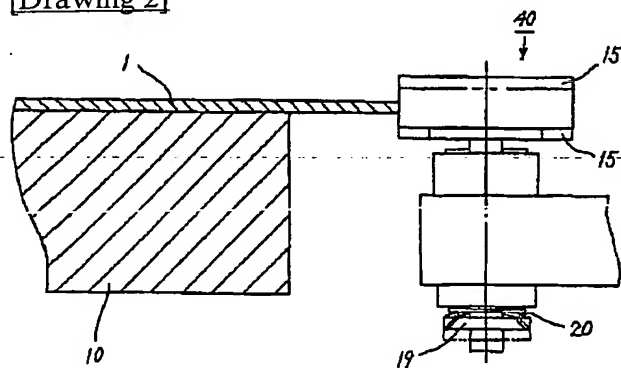


図2 実施例の動作

[Drawing 3]

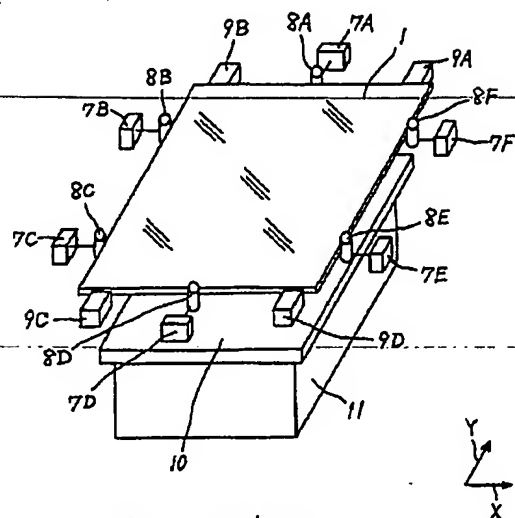


図3 従来例

[Drawing 4]

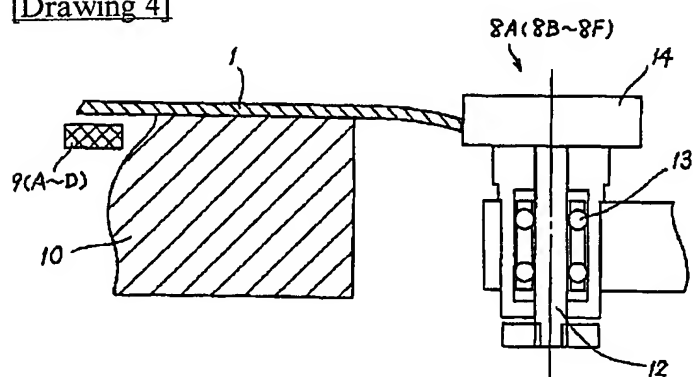


図4 従来例

[Translation done.]



(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平6-89845

(43) 公開日 平成6年(1994)3月29日

(51) Int.Cl. <sup>5</sup>	識別記号	序内整理番号	F I	技術表示箇所
H 0 1 L 21/027				
B 2 3 P 21/00	3 0 5 Z	9135-3C		
G 0 3 F 9/00	H	9122-2H		
		7352-4M	H 0 1 L 21/30	3 1 1 M
		7352-4M		3 0 1 Z

審査請求 未請求 請求項の数1(全4頁) 最終頁に続く

(21) 出願番号 特願平4-266568

(22) 出願日 平成4年(1992)9月8日

(71) 出願人 000004112

株式会社ニコン

東京都千代田区丸の内3丁目2番3号

(72) 発明者 清水 賢二

東京都千代田区丸の内3丁目2番3号株式  
会社ニコン内

(72) 発明者 太田 稔也

東京都千代田区丸の内3丁目2番3号株式  
会社ニコン内

(74) 代理人 弁理士 田辺 恵基

(54) 【発明の名称】 基板位置決め装置

(57) 【要約】

【目的】 所定の仮受台に載置された基板の周囲を押付けローラによつて押し付けることにより基板を位置決めした後、基板の下方に設けられたホルダを上昇させることによつて基板をホルダ上に載置する基板位置決め装置において、基板が押付けローラによつて押し付けられた状態で上昇することにより発生する基板の反りを防止する。これにより基板と押付けローラ間の発塵、基板の欠け等も防止する。

【構成】 位置決め対象となる基板1の上昇に伴つて上昇するローラ15を有する押付けローラ40を用いて基板1を位置決めするようにしたことにより、基板1の反りを防止することができる。

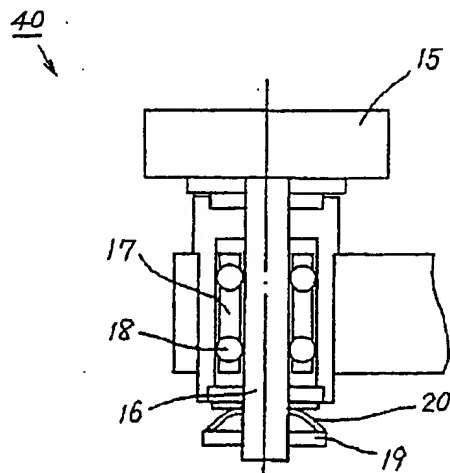


図1 実施例の構成

1

## 【特許請求の範囲】

【請求項1】周辺部を所定の仮受台に載置された基板の周囲を押付けローラによつて押し付けることにより上記基板を位置決めした後、上記基板の下方に設けられたホルダを上昇させることによつて上記基板を上記ホルダ上に載置する基板位置決め装置において、

上記押付けローラは、上記ホルダの上記上昇方向に沿つて延びた軸を中心として回転すると共に上記ホルダの上記上昇方向に移動するローラで構成されており、

上記ホルダの載置面上に上記基板が載置される際の上記基板の移動に応じて、上記基板に押し付けられた上記ローラを移動させるようにしたことを特徴とする基板位置決め装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は基板位置決め装置に関し、例えば半導体ウエハ又はガラス基板等の被露光部材としての基板を機械的に位置決めするプリアライメント装置に適用して好適なものである。

## 【0002】

【従来の技術】従来、液晶表示素子又は半導体素子等を製造する露光装置においては、被露光基板となるガラスプレート又は円板状の半導体ウエハを予め決められた位置に予備的にアライメントするプリアライメント装置が組み込まれている。このプリアライメント装置においては、ガラスプレート又はウエハ等の基板を機械的に基準ピン等に押しつけるようになされている。

【0003】すなわち図3に示すように、基板位置決め装置は基板としてのガラスプレート1を一時支持すると共に位置決めするための仮受台9A~9Dを備え、仮受台9A~9Dの周辺にはガラスプレート1の位置決めを行う押付けローラ8A~8Fが設けられている。この押付けローラ8A~8Fは駆動装置7A~7Fによつて仮受台9A~9D上のガラスプレート1の対辺どうしを押圧する方向に駆動され、これによりガラスプレート1を仮受台9A~9D上で位置決めするようになされている。

【0004】すなわち図3において、駆動装置7A~7Fが対応する各押付けローラ8A~8Fを退避位置にセットした後、プレート搬送装置（不図示）によつてガラスプレート1を仮受台9A~9D上に載置する。

【0005】このとき仮受台9A~9Dにおいては気体供給源（不図示）からの圧力气体を載置面とガラスプレート1の裏面との間に供給し、仮受台9A~9Dとガラスプレート1の間にミクロンオーダの気体層（エアベアリング）が形成される。その後駆動装置7A~7Fによつて押付けローラ8A~8FをそれぞれX、Y方向に移動し、対辺どうしをそれぞれ所定の押圧力で押圧する。

【0006】この状態で真空配管装置（不図示）を備えたホルダ10が所定の駆動装置（不図示）によつてステ

2

ージ11と共に上昇する。これによりガラスプレート1はホルダ10上の所定位置にプリアライメントされたまま吸着と同時に仮受台9A~9Dから受け取る。その後、押付けローラ8A~8Fは再び退避位置まで戻り、ステージ11は露光位置まで上昇し続ける。

## 【0007】

【発明が解決しようとする課題】ところで、図3に示すプリアライメント装置においては、それぞれ押付けローラ8A~8Fは図4に示すように構成されている。すなわち押付けローラ8A~8Fはそれぞれホルダ10及び仮受台9A~9Dに対して一定の位置に設置され、ラジアルベアリング13によつて軸12が回転自在に枢支され、当該軸12の先端部に合成樹脂性のローラ14が軸12と一体に回転し得るように構成されている。

【0008】ここで押付けローラ8A~8Fによつて押し付けられた状態でガラスプレート1を仮受台9A~9Dからホルダ10に受け渡す際、ガラスプレート1が押付けローラ8A~8Fのローラ14に当接した状態となり、さらにガラスプレート1がローラ14に当接したままの状態ホルダ10が上昇することになる。

【0009】ところがこのような押付けローラ8A~8Fは、軸12に対して平行な方向の自由移動ができないことにより、ホルダ10の上昇に伴つてガラスプレート1が下方に反ることになる。従つてガラスプレート1及びローラ14間の発塵、欠け及び次工程における微小なひびが原因となるガラスプレート1の割れを誘発する問題があつた。

【0010】この問題点を解決するための一つの方法として、上昇してくるホルダ10にガラスプレート1が吸着される瞬間に押付けローラ8A~8Fを退避位置へ移動させる方法がある。ところがこの方法においては、ガラスプレート1を吸着する際に押付けローラ8A~8Fが押し付けていない状態となることにより、プリアライメントの精度が低下する問題があり、解決策としては未だ不十分であつた。

【0011】本発明は以上の点を考慮してなされたもので、ガラスプレート等の基板に反りが生じないようにし得る基板位置決め装置を提案しようとするものである。

## 【0012】

【課題を解決するための手段】かかる課題を解決するため本発明においては、周辺部を所定の仮受台9A~9Dに載置された基板1の周囲を押付けローラ40によつて押し付けることにより基板1を位置決めした後、基板1の下方に設けられたホルダ10を上昇させることによつて基板1をホルダ10上に載置する基板位置決め装置において、押付けローラ40は、ホルダ10の上昇方向に沿つて延びた軸16を中心として回転すると共にホルダ10の上昇方向に移動するローラ15で構成されており、ホルダ10の載置面に基板1が載置される際の基板1の上昇移動に応じて、基板1に押し付けられたローラ

15を移動させるようにする。

【0013】

【作用】基板1の上昇移動に応じて、当該基板1に押し付けられたローラ15を移動し得るようにしたことにより、基板1の反りを防止することができる。

【0014】

【実施例】以下図面について、本発明の一実施例を詳述する。

【0015】図1は本発明による基板位置決め装置の押付けローラ40を示し、図3に示すブリアライメント装置の押付けローラ8A~8Fに代えて用いられる。この押付けローラ40は合成樹脂によつて形成された円筒状のローラ15が軸16に直結され、軸16の周囲には円筒状リテーナ17に保持された複数のベアリング18が配置されている。

【0016】これらがガラスプレート1(図3)及び仮受台9A~9D(図3)に対して位置出しされた保持部(不図示)に組み込まれる。これによりローラ15は転動及び上方へ移動することができる。ガラスプレート1はこのローラ15の周面に軸16の方向と直交する方向  
20 40

【0017】また軸16の下端部にはストツバ19が固定されており、当該ストツバ19によつて板ばね20が保持されている。従つてローラ15及び軸16が抜け出ないようにすることができる。ここで押付けローラ40がガラスプレート1によつて上方に変位する際、板ばね20の付勢力に抗することになるが、その力は押付けローラ40が自重によつて下方へ落ちるのを助ける程度のものである。なお、この板ばね20は、軸16が無負荷状態で下方に位置する場合には特に設ける必要はない。

【0018】以上の構成において、図2に示すように不図示の駆動装置によつてホルダ10が上昇しながらガラスプレート1を受け取る。ガラスプレート1は始め押付けローラ40のローラ15の位置で当接しており、その後ガラスプレート1が上昇するに伴つてローラ15は上方へ引き上げられる。このとき板ばね20は押し付けられ、下方への付勢力を発生するが、この付勢力は極めて小さいものであり、ガラスプレート1の周辺部を変形させることはない。

【0019】ガラスプレート1の受渡しが終了すると同時に不図示の駆動装置によつて押付けローラ40は退避位置に戻される。この際、ガラスプレート1及びローラ15が離間することにより、ローラ15は板ばね20によつて所定の位置に引き戻される。

【0020】この押付けローラ40は図3と同様にし、仮置台9A~9Dの周囲に6箇所配置され、図3に

ついて上述したシーケンスと同様の動作によつてガラスプレート1の位置決め及び受渡しを行う。かくしてガラスプレート1の上昇に応じて押付けローラ40のローラ15が上昇することにより、ガラスプレート1に反りを生じないようにすることができる。

【0021】以上の構成によれば、ガラスプレート1の上昇に伴つて上昇するローラ15を有する押付けローラ1を用いてガラスプレート1の位置決めを行うようにしたことにより、ガラスプレート1及びローラ15間において摩擦による発塵又はガラスプレート1の欠けを防止  
10 20

【0022】なお上述の実施例においては、付勢部材として板ばね20を用いた場合について述べたが、本発明はこれに限らず、コイルばね等の他の付勢手段を適用しても上述の場合と同様の効果を得ることができる。

【0023】また上述の実施例においては、位置決め対象となる基板としてガラスプレート1を用いる場合について述べたが、本発明はこれに限らず、半導体ウエハ  
20 40

【0024】さらに上述の実施例においては、本発明をプロキシミティタイプの露光機に適用した場合について述べたが、本発明はこれに限らず、他の種々の機器の高精度を必要とする受渡し部においてもこれを適用して好適である。

【0025】

【発明の効果】上述のように本発明によれば、位置決め対象となる基板の上昇に伴つて上昇するローラを有する押付けローラを用いて基板を位置決めするようにしたことにより、基板の反りを防止することができ、これにより基板及びローラ間の摩擦を防ぐことができる。従つて当該基板及びローラ間で摩擦による発塵及び基板の欠け等の破損を防止し得る基板位置決め装置を実現できる。

【図面の簡単な説明】

【図1】本発明による基板位置決め装置の押付けローラを示す断面図である。

【図2】実施例の動作の説明に供する側面図である。

【図3】従来のブリアライメント装置を示す斜視図である。

【図4】従来の押付けローラを示す断面図である。

【符号の説明】

1……ガラスプレート、9A~9D……仮受台、10……ホルダ、15……ローラ、16……軸、19……ストツバ、20……板ばね、40……押付けローラ。

【図1】

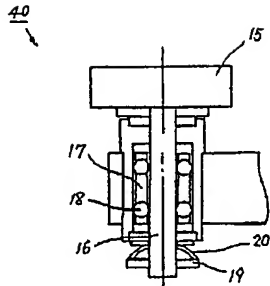


図1 実施例の構成

【図2】

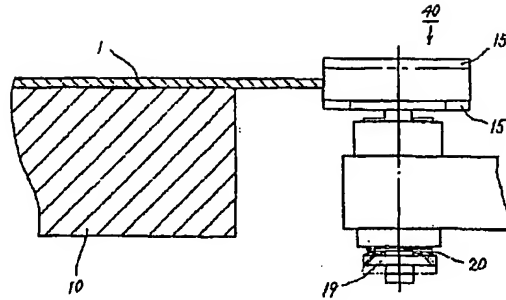


図2 実施例の動作

【図3】

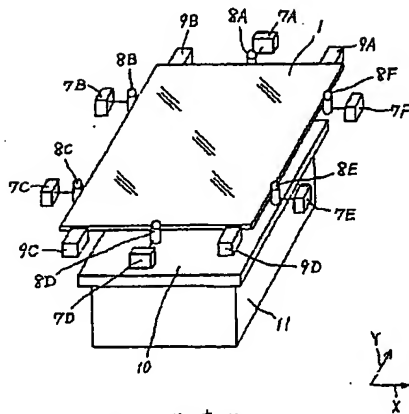


図3 従来例

【図4】

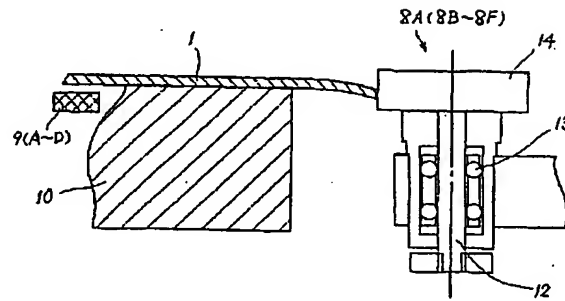


図4 従来例

フロントページの続き

(51) Int. Cl.<sup>3</sup>  
H01L 21/68識別記号 庁内整理番号  
G 8418-4M

F I

技術表示箇所

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**